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pushed part way through the earth. The second form differs from the first in the possession of an annulus and also in its habit. Several plants of this may arise from the one comb, while at the same time many immature specimens capable of further growth may be present in the comb. The author regards the presence or absence of the annulus as an accidental character due to the conditions of growth; and, since the forms are identical in every other respect, he considers them to belong to a single species which he calls *Volvaria eurrhiza*, reducing the other names to synonyms. Whatever may be said of the identity of the two forms, this disposition is entirely erroneous, for *Volvaria* has a free valve at the base of the stem, but possesses no annulus. These forms, judging from the descriptions and figures, have no free valve; but one has an annulus while the other has not. They will probably find a place in *Pluteus* or *Annularia*.

Beside the fungi described, a third form seems to be quite universally present in the fresh termite comb, although this form, which is determined as *Xylaria nigripes*, does not appear in the nests. If, however, the combs are removed and kept under bell-jars, the *Xylarias* always appear, forming first a conidial stroma, which is followed by the development of perithecia. The author believes that the *Xylarias* do not appear in the nests merely because they are eaten off by the termites as soon as they appear. Other forms of fungi growing on the combs when placed in a moist chamber are probably accidental saprophytes.

All of the forms described are eaten by the termites. When an inhabited comb is inclosed under a bell-jar the termites eat off the heads of the hyphomycete and also the *Xylaria* as it develops. They also eat the stalks of the agarics, following them to the surface of the ground. It is probable, therefore, that the fungi of the termite nests form food for the inhabitants, as do the "fungus gardens" for the leaf-cutting ants. It is difficult to prove this definitely by experiment, for in the absence of other foods the termites will eat many substances which do not ordinarily form part of their ration.—H. HASSELBRING.

Sperms of *Cycas*.—SHIBATA and MIYAKE⁷ have been experimenting with sperms of *Cycas*. Material was sent from southern Japan to Tokyo late in September and early in October, at which time the pollen tubes are discharging their sperms. Experiments with various solutions showed that the sperms either lack chemotactic irritability, or chemotaxis can take place only under some unknown external conditions. If chemotactic irritability has been lost, fertilization must be accomplished by mechanical means. It is interesting to note that the contents of the archegonium, while they seem to exert no influence upon *Cycas* sperms, nevertheless attract those of some pteridophytes.—CHARLES J. CHAMBERLAIN.

CORRENS⁸ has tested the influence of external factors on the sex-condition

⁷ SHIBATA, K., and MIYAKE, K., Some observations on the physiology of *Cycas* spermatozoids. *Botanical Magazine* 21:45-48. 1907.

⁸ CORRENS, C., Zur Kenntnis der Geschlechtsformen polygamer Blütenpflanzen und ihrer Beeinflussbarkeit. *Jahrb. Wiss. Bot.* 44:124-173. figs. 4. 1907.

of gynodioecious plants. His studies in the inheritance of these plants had led him to believe that some plants which he had classed as pistillate were really bisporangiate, and he now finds support for this conclusion in the fact that lessened nutrition (using the term in its widest sense) decreases the development of the stamens, and, in the cases more nearly approaching starvation, suppresses them. Gynomonoecious individuals give evidence for the same fact in that the bisporangiate flowers occupy the most advantageous places in the inflorescence, and appear in the greatest proportion at the height of the flowering season, the earlier and especially the later flowers being largely or entirely monosporangiate. The truly pistillate plants cannot be made to produce bisporangiate flowers through increased nourishment. This is held to support the author's view that the pistillate form in gynodioecious species and the staminate form in androdioecious species are fundamentally distinct and have arisen from the original bisporangiate forms by mutation, and that they are not to be accounted for as the gradual accumulations of minor advantageous fluctuations, nor as due in any way to ordinary physiological response. There is some indication of the presence of distinct "lines" in *Salutrea hortensis*, in JOHANNSEN'S sense. CORRENS adheres strictly to the view that nothing heritable can originate except through mutation, holding with NÄGELI and others that the essence of mutation lies not in the size of the step but in its heritability.—G. H. SHULL.

Halophytism.—From his study of the flora of the sea coast at Cagliari, CASU⁹ found three features which appeared to depend upon the presence of marine salts in the soil: (1) the sporadic distribution of the plants and their general dwarfing; (2) the prevalence of herbaceous over woody plants in number and extension of species; (3) the prevalent ubiquity of certain species in contact with saline solutions. In order to elucidate these points, he has made a special physico-chemical study of the soil of the beach and shore at the surface and at various depths, both when seeds were just germinating and when plants were growing, and has compared the chemical composition of the plant and the soil. After summarizing the very contradictory statements made by other observers, which are due, he thinks, to the imperfect and artificial conditions used by most experimenters, he attempted to study the physiological resistance of plants to sea salts under natural conditions. His results agree in showing that the phenomena named above are quite independent of the toxic or the nutritive value of the salts and are rather a multifiform effect of more general conditions. Thus, by way of summary he says: the presence of germinating plants at the time of the reactivation of vegetation depends on the presence of organic residues at the surface of the soil and on its hardness; the true factor of distribution of the species is the physico-chemical structure of the soil; the prevalence of herbs and dwarfing are due to impoverishment of the soil; neither the percentage of salts in contact with the roots nor that of any single salt

⁹ CASU, A., Contribuzione allo studio della flora delle saline di Cagliari. Parte III. Resistenza fisiologica della flora delle saline all' azione del sale marino. *Annali di Botanica* 5:273-354. 1907.